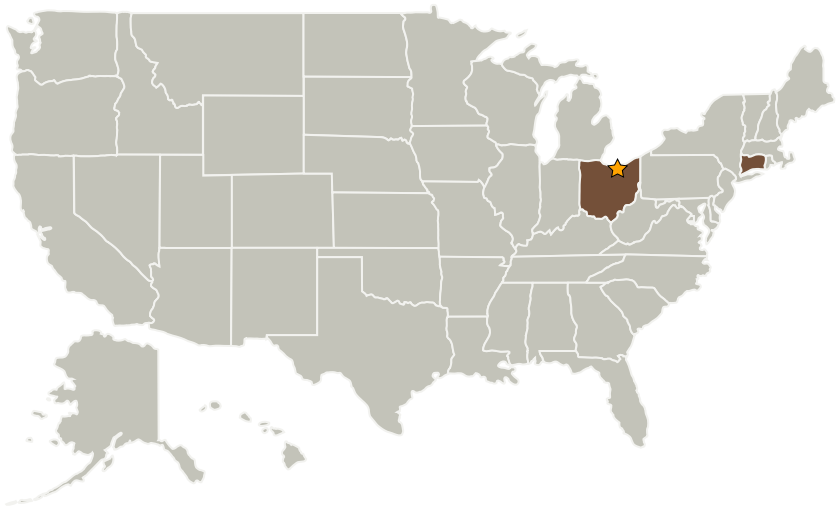
A Renewed Approach for Large Eddy Simulation of Complex Geometries, Phase II

Completed Technology Project (2007 - 2009)

Project Introduction

The potential benefits of Large Eddy Simulation (LES) for aerodynamics and combustion simulation hvae largely been missed, due to the complexity of generating grids for complex topologies, and the requirement for boundary fitted grids which reduce the accuracy of the method. The Phase 2 Program builds on the Cartesian grid LES flow solver developed under Phase 1, and includes new techologies such as immersed boundary conditions, multigrid code acceleration, compressibility, and advanced subgrid scale models for turbulence and combustion. Experimental validation cases using NASA-sponsored experiments, and using actual aeroengine combustor hardware will be performed, comparing the LES flow solver results with experimental combustor exit temperatures, and with other code predictions, providing a unique opportunity for validation of the flow solver.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Flow Parametrics, LLC	Supporting Organization	Industry	Ivoryton, Connecticut

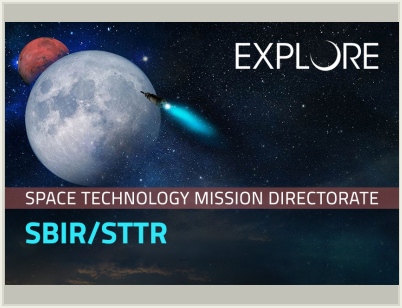


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Table of Contents

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations	
Connecticut	Ohio

Project Transitions

November 2007: Project Start

November 2009: Closed out

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX09 Entry, Descent, and Landing
  - TX09.4 Vehicle Systems
    - TX09.4.5 Modeling and Simulation for EDL